

WHAT IS CLAIMED IS:

1. An active matrix display device having a pixel matrix circuit, said pixel matrix circuit comprising:

at least one active layer comprising crystalline semiconductor film over an insulating surface of said substrate, said active layer having at least channel, source, and drain regions of a thin-film transistor;

a gate electrode formed over the channel region with an gate insulating film therebetween;

a pair of side walls formed adjacent to side surfaces of the gate electrode;

a pair of low impurity concentration regions formed in the active layer below the side walls; and

an auxiliary capacitor comprising a first electrode connected to one of the source and drain regions formed on the first electrode and a second electrode.

2. The device according to claim 1, wherein said active matrix display device is a liquid crystal device.

3. The device according to claim 1 further comprising a pixel electrode over the auxiliary capacitor wherein said pixel electrode is connected to said first electrode.

4. The device according to claim 1 wherein the channel region has a plurality of crystals extending approximately in parallel with a carrier flow direction of the channel region.

5. An active matrix display device having a pixel matrix circuit, said pixel matrix circuit comprising:

at least one active layer comprising crystalline semiconductor film over an insulating surface of said substrate, said active layer having at least channel, source, and drain regions of a thin-film transistor;

a gate electrode formed over the channel region with an gate insulating film therebetween;

a pair of side walls formed adjacent to side surfaces of the gate electrode, wherein said active layer is provided with a pair of metal silicide regions formed on the source and drain regions;

    a pair of low impurity concentration regions formed in the active layer below the side walls;

    an auxiliary capacitor comprising a first electrode connected to one of the source and drain regions formed on the first electrode and a second electrode.

6. The device according to claim 5, wherein said active matrix display device is a liquid crystal device.

7. The device according to claim 5 further comprising a pixel electrode over the auxiliary capacitor wherein said pixel electrode is connected to said first electrode.

8. The device according to claim 5 wherein the channel region has a plurality of crystals extending approximately in parallel with a carrier flow direction of the channel region.

9. An active matrix display device having a pixel matrix circuit, said pixel matrix circuit comprising:

    at least one active layer comprising crystalline semiconductor film over an insulating surface of said substrate, said active layer having at least channel, source, and drain regions of a thin-film transistor;

    a gate electrode comprising crystalline silicon formed over the channel region with an gate insulating film therebetween;

    a pair of side walls formed adjacent to side surfaces of the gate electrode, wherein said active layer is provided with a pair of metal silicide regions formed on the source and drain regions;

    a pair of low impurity concentration regions formed in the active layer below the side walls;

    an auxiliary capacitor comprising a first electrode connected to one of the source and drain regions formed on the first electrode and a second electrode,

wherein an upper surface of said gate electrode comprises a metal silicide.

10. The device according to claim 9, wherein said active matrix display device is a liquid crystal device.

11. The device according to claim 9 further comprising a pixel electrode over the auxiliary capacitor wherein said pixel electrode is connected to said first electrode.

12. The device according to claim 9 wherein the channel region has a plurality of crystals extending approximately in parallel with a carrier flow direction of the channel region.

13. A projection device having an active matrix display device including a pixel matrix circuit, said pixel matrix circuit comprising:

at least one active layer comprising crystalline semiconductor film over an insulating surface of said substrate, said active layer having at least channel, source, and drain regions of a thin-film transistor;

a gate electrode formed over the channel region with an gate insulating film therebetween;

a pair of side walls formed adjacent to side surfaces of the gate electrode;

a pair of low impurity concentration regions formed in the active layer below the side walls; and

an auxiliary capacitor comprising a first electrode connected to one of the source and drain regions formed on the first electrode and a second electrode,

wherein the channel region has a plurality of crystals extending approximately in parallel with a carrier flow direction of the channel region.

14. The device according to claim 13, wherein said active matrix display device is a liquid crystal device.

15. The device according to claim 13 further comprising a pixel electrode over the auxiliary capacitor wherein said pixel electrode is connected to said first electrode.

16. A projection device having an active matrix display device including a pixel matrix circuit, said pixel matrix circuit comprising:

at least one active layer comprising crystalline semiconductor film over an insulating surface of said substrate, said active layer having at least channel, source, and drain regions of a thin-film transistor;

a gate electrode formed over the channel region with an gate insulating film therebetween;

a pair of side walls formed adjacent to side surfaces of the gate electrode, wherein said active layer is provided with a pair of metal silicide regions formed on the source and drain regions;

a pair of low impurity concentration regions formed in the active layer below the side walls;

an auxiliary capacitor comprising a first electrode connected to one of the source and drain regions formed on the first electrode and a second electrode,

wherein the channel region has a plurality of crystals extending approximately in parallel with a carrier flow direction of the channel region.

17. The device according to claim 16, wherein said active matrix display device is a liquid crystal device.

18. The device according to claim 16 further comprising a pixel electrode over the auxiliary capacitor wherein said pixel electrode is connected to said first electrode.